

WHAT IS CLAIMED IS:

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1           1.       A method to install a tool in a well, comprising:  
2           running the tool into the well; and  
3           fixing the tool to the well with a fixing agent without pumping the fixing agent  
4           through a central passageway of the tool.

1           2.       The method of claim 1, wherein the fixing agent comprises cement.

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1           3.       The method of claim 1, wherein the tool comprises a casing conveyed  
2           tool.

1           4.       The method of claim 1, wherein the fixing comprises pumping the fixing  
2           agent into the well and then running the tool into the well.

1           5.       The method of claim 4, further comprising:  
2           isolating a bottom of the tool to prevent the fixing agent from entering the central  
3           passageway of the tool.

1           6.       The method of claim 5, wherein the isolating comprises sealing off a  
2           bottom end of the tool.

1           7.       The method of claim 4, wherein the fixing comprises:  
2           running a tubing to a region where the tool is to be fixed to the well; and  
3           communicating the fixing agent into the well via the tubing.

1           8.       The method of claim 4, wherein the fixing comprises:  
2           pumping the fixing agent into an uncased region of the well.

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1           9.     The method of claim 4, further comprising:  
2           running a perforating gun string inside the tool; and  
3           firing the perforating gun.

1           10.    The method of claim 1, wherein the fixing comprises:  
2           running the tool into the well; and  
3           subsequently pumping the fixing agent into an annulus surrounding the tool.

1           11.    The method of claim 10, wherein the pumping comprises:  
2           using reverse circulation to pump the fixing agent into the annulus.

1           12.    The method of claim 10, further comprising:  
2           isolating the bottom of the tool to prevent the fixing agent from entering the  
3           central passageway of the tool.

1           13.    The method of claim 10, further comprising:  
2           running a perforating gun string inside the tool; and  
3           firing the perforating gun.

1           14.    The method of claim 1, wherein the fixing comprises:  
2           running a casing into a wellbore of the well; and  
3           running the tool inside the casing.

1           15.    The method of claim 14, further comprising:  
2           pumping the fixing agent between the casing and the tool.

1           16.    The method of claim 14, further comprising:  
2           running a perforating gun inside the tool; and  
3           firing the perforating gun.

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1           17.    A method usable with a subterranean well, comprising:  
2           running a tool into the well via a protection tubing;  
3           introducing a fixing agent into the well after the running so that the fixing agent at  
4   least partially surrounds the tool; and  
5           operating the tool after the fixing agent sets.

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          18.    The method of claim 17, wherein the fixing agent comprises cement.

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          19.    The method of claim 17, wherein the tool comprises a casing conveyed  
2   tool.

          20.    The method of claim 17, wherein the operating the tool comprises firing a  
perforating gun.

1           21.    The method of claim 17, wherein the introducing the fixing agent  
2   comprises:  
3           introducing the fixing agent via a tubing; and  
4           retrieving the tubing after the introduction of the fixing agent.

1           22.    The method of claim 17, where the tool is part of a perforating gun string,  
2   the method further comprising:  
3           using the perforating gun string as a production tubing.

1           23.    The method of claim 22, further comprising:  
2           cleaning out the perforating gun string before using the gun string as the  
3   production tubing.

1           24.     A method usable with a subterranean well, comprising:  
2           introducing a tool into the well;  
3           introducing a fixing agent into an annulus between the tool and a wall of the well;  
4           isolating a central passageway of the tool from the fixing agent; and  
5           operating the tool after the cementing.

1           25.     The method of claim 24, wherein the operating the tool comprises:  
2           firing a perforating gun.

1           26.     The method of claim 24, wherein the introducing the fixing agent  
2     comprises:  
3           running a tubing into the wellbore;  
4           introducing the fixing agent via the tubing; and  
5           retrieving the tubing after the introduction of the fixing agent.

1           27.     The method of claim 24, wherein the tool is part of a perforating gun  
2     string, the method further comprising:  
3           using the perforating gun string as a production tubing.

1           28.     The method of claim 27, further comprising:  
2           cleaning out the perforating gun string before using the gun string as the  
3     production tubing.

1           29.     The method of claim 24, wherein the fixing agent comprises cement.

1           30.     A method usable with a subterranean well, comprising:  
2           running a tool into a wellbore of the subterranean well;  
3           running a sensor into the wellbore next to the tool; and  
4           using the sensor to monitor the introduction of a fixing agent to fix the tool inside  
5     the well.

1           31.     The method of claim 30, wherein the using the sensor comprises:  
2     using an optical fiber.

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1           32.     A perforating gun comprising:  
2             a casing body comprising a longitudinal axis;  
3             a fin radially extending from the casing body; and  
4             a perforating charge attached to the fin and oriented to generate a perforation jet  
5     in a radial direction away from the longitudinal axis of the casing body.

1           33.     The perforating gun of claim 32, further comprising:  
2             a plug to seal a passageway in the casing body, the plug adapted to rupture in  
3     response to the perforating charge firing to open communication through the casing body.

1           34.     The perforating gun of claim 32, wherein the fin includes a groove  
2     adapted to receive a detonating cord that is coupled to the perforating charge.

1           35.     The perforating gun of claim 32, wherein the perforating charge is adapted  
2     to permit well fluid to flow through the remnants of the perforating charge after firing of  
3     the perforating charge.

1           36.     The perforating gun of claim 32, further comprising:  
2             a ballistic junction to couple a detonating cord extending to the perforating charge  
3     to a detonating cord extending to a perforating charge of another perforating gun.

1           37.     The perforating gun of claim 36, wherein the ballistic junction comprises:  
2             a first sleeve adapted to receive the first detonating cord; and  
3             a second sleeve coupled to the first sleeve adapted to receive the second  
4     detonating cord.

1           38.     The perforating gun of claim 36, further comprising:  
2           a detonating cord circumferentially disposed around the casing body to transfer  
3 charges between detonating cords of the perforating gun.

1           39.     The perforating gun of claim 32, wherein the fin is one of a plurality of  
2 fins radially extending from the casing body.

1           40.     The perforating gun of claim 39, wherein the perforating charge is one of a  
2 plurality of perforating charges disposed in the fins and oriented to generate perforation  
3 jets in radial directions from the longitudinal axis of the casing body.

1           41.     The perforating gun of claim 40, wherein at least one of the perforating  
2 charges is adapted to permit well fluid to flow through the remnants of the perforating  
3 charge after firing of said at least one perforating charge.

1           42.     The perforating gun of claim 40, wherein the perforating charges are  
2 oriented in a planar phasing pattern.

1           43.     The perforating gun of claim 40, wherein the perforating charges are  
2 oriented in a spiral phasing pattern.

1           44.     The perforating gun of claim 39, wherein each of the fins includes a  
2 groove adapted to receive a detonating cord.

1           45.     A system usable with a subterranean well comprising:  
2 a fixing agent; and  
3 a tool set in the fixing agent, a bottom end of the tool being sealed to prevent the  
4 fixing agent from entering the tool before the fixing agent is set.

1           46.     The system of claim 45, wherein the tool comprises a perforating gun.

1           47.     The system of claim 45, wherein the fixing agent comprises cement.

1           48.     A system usable with a subterranean well, comprising:  
2           a fixing agent;  
3           a perforating gun string set in the fixing agent,  
4           wherein the perforating gun is adapted to produce well fluid from the well  
5           through the production tubing after the perforating gun fires.

1           49.     The system of claim 48, wherein the fixing agent comprises cement.

1           50.     The system of claim 48, further comprising:  
2           an optical fiber attached to the gun string; and  
3           a circuit coupled to the optical fiber and adapted to monitor the fixing agent prior  
4           to setting of the fixing agent.

1           51.     The system of claim 50, wherein the circuit is adapted to use the optical  
2           fiber to monitor a temperature of the fixing agent.

1           52.     A method usable with a subterranean well comprising:  
2           forming a section of a casing string to be inserted into a subterranean well;  
3           forming an outer fin on the casing section; and  
4           attaching a perforating charge to the fin, the perforating charge being oriented to  
5           generate a perforation jet in a radial direction away from a longitudinal axis of the casing  
6           body.

1           53.     The method of claim 52, further comprising:  
2           inserting a plug into a passageway of the casing body, the plug adapted to rupture  
3           in response to the perforating charge firing to open communication through the casing  
4           body.

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1           54.    The method of claim 52, further comprising:  
2           forming a groove in the fin to receive a detonating cord.

1           55.    The method of claim 52, further comprising:  
2           flowing well fluid through the remnants of the perforating charge after firing of  
3 the perforating charge.

1           56.    The method of claim 52, further comprising:  
2           ballistically coupling the perforating charge to another perforating charge of an  
3 adjacent casing section.

1           57.    The method of claim 52, further comprising:  
2           forming at least one additional outer fin on the casing section.

1           58.    The method of claim 57, further comprising:  
2           attaching at least one additional perforating charge to said at least one additional  
3 outer fin.

1           59.    The method of claim 58, further comprising:  
2           flowing well fluid through the remnants of the perforating charges after firing of  
3 the perforating charge.

1           60.    The method of claim 57, further comprising:  
2           forming at least on additional groove in said at least one additional outer fin to  
3 receive a detonating cord.